

FAUNAL COMPOSITION AND FLIGHT ACTIVITY OF SOME TUMBLING FLOWER BEETLES (COLEOPTERA: MORDELLIDAE) IN SOUTHERN QUEBEC (CANADA)¹

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ABSTRACT: One hundred and fifty seven adults of 13 Mordellidae species were collected with flight intercept traps during 1987-1989 at four sites in southern Québec. The five most abundant species were *Mordella* prob. *atrata*, *Mordellistena scapularis*, *Mordellistena* sp., *Tomoxia borealis* and *T. serval*. They flew mainly in mid-summer probably during their reproduction period.

Seventy species and subspecies of mordellids have been recorded in Canada (McNamara 1991). Liljeblad (1945) revised the North American species of Mordellidae and Jackman (1991) discussed recently some nomenclatural changes. Nevertheless, a modern revision would be useful. Members of Anaspini, which used to be included within Mordellidae, are now in the family Scaptiidae (McNamara 1991).

Several species are linked with weedy vegetation. Adults are commonly found on flowers on which they feed (McNamara 1991). Mordellid larvae are represented in entomological complexes of phytobionts and xylobionts, being destructors of living and dying vegetative organic matter (Odnosum 1992).

Little is known about the faunal composition and seasonal activity of adult Mordellidae. We found many individuals of this family in flight intercept traps during a study of beetles in a raspberry (*Rubus idaeus* L.) plantation and adjacent sites in southern Québec. We present results on the faunal composition of mordellids from four sites adjacent to a raspberry plantation, and also the seasonal flight activity of some abundant species, over a three-year period (1987-1989).

MATERIALS AND METHODS

Beetles were collected from early May through late October on a monocultural raspberry farm at Johnville, near Sherbrooke, in southern Québec, Canada. We studied beetles flying close to the ground with flight intercept traps at four sites: 1) an open site near the center of the plantation (Table 1, A), about 20 m from old plants; 2) an open site near a pond (Table 1, B), about

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5 m from young raspberry plants; 3) a pine woods-raspberry field boundary (Table 1, C); and 4) an adjacent pine woods (Table 1, D) dominated by eastern white pine, *Pinus strobus* L. These traps were not located between rows of raspberry plants because of grower's activities and public access during harvest. Flight intercept traps were modified from the large-area "window" trap design promoted by Peck and Davies (1980). Each consisted of a gray 1.5 mm mesh window screen (1.22 m height, 1.52 m width, about 1.85m² of surface) fastened to a wooden frame. The frame itself was suspended by two lateral triangular wooden supports (1.83 m at the base, 1.25 m height), 2-4 cm over a set of two galvanized metal pans (25 by 61 cm at the top, 7.5 cm deep) which were placed directly on the ground. The insects were caught in the pans partially filled with 2% formalin into which a few drops of detergent were added. We installed one intercept flight trap at each site; however, the pine woods trap (Table 1, D) was only operated in 1988 and 1989. Samples were collected twice a week. Levesque and Levesque (1992) presented detailed information about the sampling method and study sites, including a sketch-map of the raspberry farm and the description of plant communities.

Table 1. Mordellidae species captured in flight intercept traps at Johnville, Québec (1987-1989).

Species	Open site near center (A)	Open site near pond (B)	Boundary (C)	Pine woods ^a (D)	Total
<i>Mordella</i> prob. <i>atrata</i> Melsh.	15	15	1	0	31
<i>Mordellistena andreae andreae</i> LeC.	0	1	0	0	1
<i>Mordellistena frosti</i> Liljeblad	0	0	1	0	1
<i>Mordellistena marginalis</i> (Say)	0	1	0	0	1
<i>Mordellistena nigricans</i> (Melsh.)	2	4	0	0	6
<i>Mordellistena</i> prob. <i>picalabris</i> Helmuth	0	1	1	0	2
<i>Mordellistena quadrinotata</i> Liljeblad	0	1	0	0	1
<i>Mordellistena scapularis</i> (Say)	0	0	9	2	11
<i>Mordellistena</i> sp.	16	37	0	0	53
<i>Mordellistena trifasciata</i> (Say)	0	2	0	0	2
<i>Tomoxia borealis</i> (LeC.)	5	2	2	4	13
<i>Tomoxia inclusa</i> LeC.	1	1	0	0	2
<i>Tomoxia serval</i> (Say)	12	3	12	6	33
Total	51	68	26	12	157
Number of species	6	11	6	3	13

^a not sampled in 1987.

RESULTS AND DISCUSSION

We collected 157 adults of 13 mordellid species mainly in the open sites near the raspberry plants (Table 1). The maximal diversity occurred in the open site near a pond (11 species), and the minimal diversity in the pine woods (3 species). *Mordella* prob. *atrata* Melsh. and *Mordellistena* sp. [near *M. aspersa* (Melsh.)] flew almost entirely in the two open sites (A and B), *Tomoxia borealis* (LeC.) and *T. serval* (Say) were captured in all four sites, whereas *Mordellistena scapularis* (Say) flew at the woods-field boundary and in the pine woods (Table 1). Brimley (1951) collected 31 mordellid species in Prince Edward County (Ontario), including nine species also caught at Johnville.

The 13 mordellid species from Johnville all flew during the summer (June-September), and we collected 11 species or 58% of the individuals in July. In comparison, for all beetle families together the flight activity was maximal in May-June (60% of total captured individuals) and decreased thereafter; only 17% of beetles flew in July.

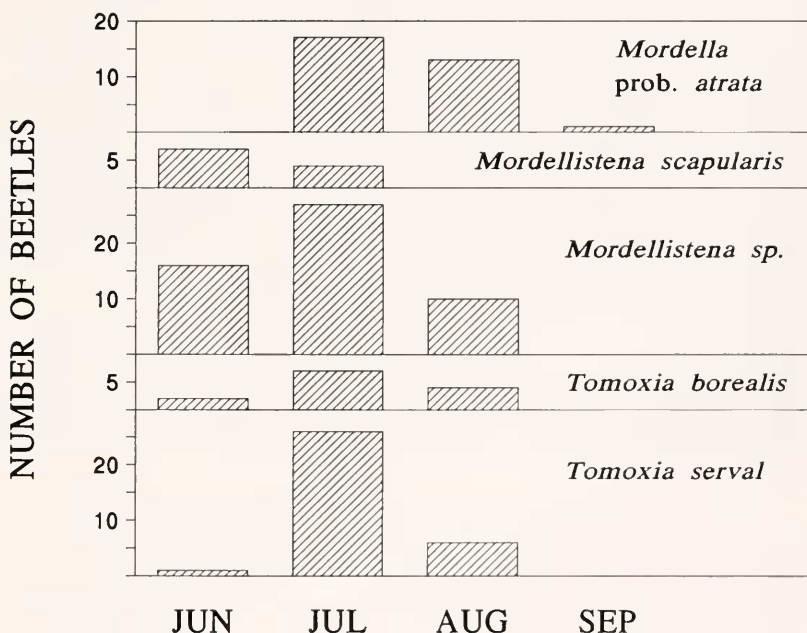


Fig. 1. Seasonal abundance of *Mordella* prob. *atrata*, *Mordellistena scapularis*, *Mordellistena* sp., *Tomoxia borealis* and *Tomoxia serval* in flight intercept traps at Johnville, Québec (1987-1989).

The flight activity of *M. prob. atrata* occurred from July to September, and that of *M. scapularis* in June-July (Fig. 1). We observed the flight of *Mordellistena* sp., *T. borealis* and *T. serval* from June to August, but mainly in July. The period of raspberry flowering occurred in June, whereas we observed during mid-summer flowers of abundant weeds: buttercup (*Ranunculus acris* L.), clovers (*Trifolium pratense* L., *T. repens* L.), ox-eye daisy (*Chrysanthemum leucanthemum* L.), common milkweed (*Asclepias syriaca* L.) and vetch (*Vicia cracca* L.). We suspect that several southern Canadian mordellid species fly during their aestival reproduction period, and that their larvae feed on weeds and overwinter.

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